

REMARKS

This Response is submitted in reply to the Final Office Action dated February 14, 2007, in which the Examiner:

indicated claims 2 and 6-11 and 19 would be allowable if rewritten in independent form; and

rejected claims 1, 3-5 and 12-18 under 35 U.S.C. § 103(a) as unpatentable over WIPO Publication No. WO 01/06624 to Sasaki et al. ("Sasaki"), in view of JP 56-71442 ("Nakada").

Applicant respectfully traverses the rejections below. Claims 1-19 are currently pending. The current Amendment amends claims 1-10 and 16, and adds claims 18 and 19, leaving claims 1-19 pending upon entrance of the current Amendment. Claims 1 and 16 are independent claims.

Applicant wishes to thank the Examiner for the English-language translation of Nakada that was supplied with the Final Office Action.

Claims 1 and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sasaki in view of Nakada. To support an obviousness rejection under 35 U.S.C. § 103(a), the Examiner must establish a prima facie case of obviousness. Where the Examiner seeks to combine or modify reference teachings, a prima facie case of obviousness is improper unless there is a motivation or suggestion to combine or modify the reference teachings.

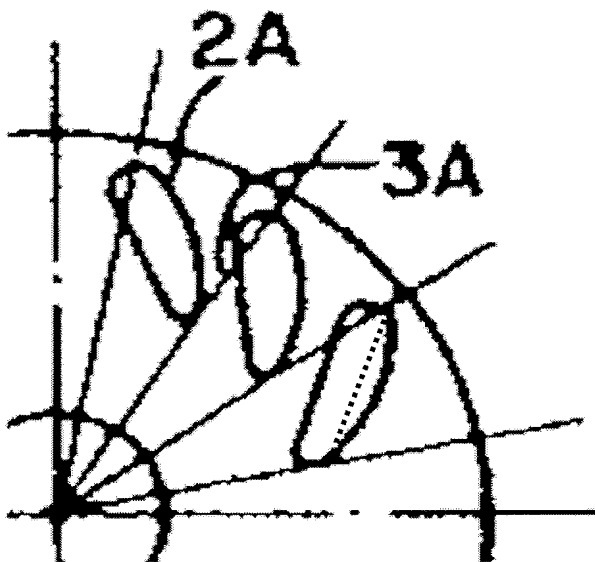
Applicant's amended claim 1 recites a rotor for an electric motor, wherein, in at least one sector, in a cross-sectional view, the accommodating spaces for the conductor rods are made to be curved along their longitudinal axis. Applicant's amended claim 16 is directed to an electric motor and includes similar recitations.

The Examiner acknowledges that Sasaki does not teach or suggest accommodating spaces for conductor rods that are curved along their longitudinal axes, but asserts that the slots 2A of Nakada's Figure 6 teach this configuration. (Final Office Action, p. 2.)

After reviewing the full text of the Nakada translation, Applicant maintains, even if Nakada's slots 2A are properly considered to be curved along their longitudinal axes, that nowhere does Nakada teach or suggest that there is anything advantageous or beneficial about the particular *shape* of slots 2A. Thus, there is no suggestion or motivation to modify the teachings of Sasaka to incorporate the *shape* of Nakada's slots 2A. The Examiner contends, however, that:

This is not persuasive because the curved "shape" in the Fig. 6 embodiment is necessary to achieve the particular disposition shown in this embodiment. In other words, the curved shape of a slot 2A in the Fig. 6 embodiment is inherently the slot's "disposition", so that one end of the slot intersects with a radial line 3A from the rotor core 1 (see translation, p. 6). (Final Office Action, p. 5; emphasis added.)

Applicant respectfully disagrees, and cannot find where Nakada ever teaches or suggests that "...the curved "shape in the Fig. 6 embodiment is necessary to achieve the particular disposition shown in this embodiment," as the Examiner asserts. In fact, a review of Figure 6 tends to suggest just the opposite – that the radial line 3A would still intersect the end of the slot 2A without the bowed section. Referring to the portion of Nakada's Figure 6 reproduced below, it can be seen that removing the bowed section of a slot 2A (as indicated by the dotted line added to the right-most slot 2A) apparently *does not* affect the intersection between the slot 2A and the radial line 3A.



Therefore, the *shape* of Nakada's slots 2A does not appear to be relevant to achieving the desired *arrangement*, wherein "...the adjacent slot parts 2A may also be *arranged* so that they intersect with the radial lines of the rotor core 1, and a similar effect [to where the slots parts contact the radial lines] can be obtained." (Nakada translation, p. 6; emphasis added.) Thus, there is no motivation or suggestion to arbitrarily modify the teachings of Sasaki to incorporate the *shape*, rather than merely the *arrangement*, of Nakada's slots 2A.

Furthermore, Applicant maintains that Sasaki teaches away from even the slot *arrangement* of Nakada, where slots 2A are arranged to either contact or intersect the radial lines 3A. However, the Examiner stated:

Applicant argues that Sasaki teaches away from the slot shape/disposition of Nakada due to the differing slot interval of Sasaki. However, applicant does not consider the entire reference. In Sasaki, embodiments five, nine and fourteen, as well as the prior art show uniform slot intervals. In these and other embodiments, efficiency is improved, for example, by providing different slot lengths or different slot to magnet hole distances or smaller flux holes than magnet retaining holes. (Final Office Action, p. 6; internal citations omitted.)

Applicant respectfully disagrees. In connection with the current claim 1 (as opposed to the current claim 3), Applicant is not arguing that Sasaki teaches away from a uniform slot interval *per se*. Rather, Applicant's point is that Sasaki teaches away from an arrangement in which the slots are arranged so as to contact or intersect every radial line extending from the rotor core, which is what Nakada suggests is advantageous about its arrangement.

While Sasaki may teach more than one means of "rendering the pattern of distribution of the magnetic flux densities in the air gap between the stator and the rotor to represent either the approximately trapezoidal waveform or the approximately sinusoidal waveform" (Sasaki, p. 28, lines 17-21), any of those means would be negatively affected by a slot arrangement designed to contact or intersect *every* radial line extending from the rotor core, thus greatly interfering with the flux leakage from Sasaki's permanent magnets (located around the rotor core) into the air gap between the stator and the rotor at *every* point around the rotor. (See also, e.g., Sasaki p. 2, line 27 – p. 3, line 5; p. 4, line 2 – p. 5, line 3; p. 5, line 21 – p. 6, line 8.)

As there is no teaching or suggestion in the references to modify the teachings of Sasaki to incorporate the *shape* of the Nakada slots, and as Sasaki teaches away from slot *arrangement* taught by Nakada, Applicant respectfully submits that the Examiner has failed to establish a proper prima facie case of obviousness. Accordingly, Applicant respectfully submits that the rejection of claims 1 and 16 under 35 U.S.C. § 103(a) as unpatentable over Sasaki in view of Nakada is improper for at least these reasons, and should be withdrawn.

Claims 3-5, 12-15 and 17 were also rejected under 35 U.S.C. § 103(a) as unpatentable over Sasaki in view of Nakada. These claims all depend, directly or indirectly, from claim 1 or claim 16, and include additional recitations thereto. Accordingly, Applicant respectfully submits that the rejection of claims 3-5, 12-15 and 17 under 35 U.S.C. § 103(a) as unpatentable over Sasaki in view of Nakada is improper for at least the same reasons stated in connection with claims 1 and 16, and should be withdrawn.

In view of the full disclosure of the Nakada, Applicant also maintains the separate arguments previously made in favor of dependent claims 3 and 5. Regarding claim 3, Applicant cannot find where Sasaki or Nakada teaches or suggests the claim 3 recitation of constant distance between accommodating spaces for the conductor rods (with the exception of the prior art embodiments that Sasaki teaches away from), as the Examiner appears to assert. (See Final Office Action, p. 6.) If the Examiner is inferring this relationship from the drawings of Sasaki or Nakada, Applicant submits that:

[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue. *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000); see also, MPEP 2125.

Therefore, the only actual teaching in the prior art references about constant distance between accommodating spaces for the conductor rods appears to be the teaching away of Sasaki.

Thus, the prior art references, considered as whole, teach away from the Examiner's proposed combination, and there is no motivation to combine Sasaki

and Nakada in a fashion that would teach or suggest that recitations of Applicant's claim 3. Accordingly, Applicant respectfully submits that the rejection of claim 3 under 35 U.S.C. § 103(a) as unpatentable over Sasaki in view of Nakada is improper for at least this additional reason, and should be withdrawn.

Regarding claim 5, Applicant respectfully disagrees with the Examiner's contention that "...the combination of Sasaki and Nakada would fulfill the claimed limitations." (Final Office Action, p. 7.) Claim 5 recites, in part, that the curvature of the accommodating spaces for conductor rods in the at least one sector is such that a radial outer end of each accommodating space for conductor rods is turned toward the magnet axis, so as to be closer to the magnet axis than if the accommodating spaces for conductor rods were not curved along their longitudinal axis. For the claim 5 rejection to be proper, either Sasaki or Nakada must teach or suggest this, or there must be some motivation to combine their teachings such that they do.

Sasaki does not teach or suggest, as the Examiner acknowledges, curved accommodating spaces for conductor rods. Therefore, Sasaki also clearly does not teach or suggest that the curvature is such that a radial outer end of each accommodating space for conductor rods is turned toward the magnet axis.

Nakada, the Examiner asserts, teaches curved slots 2A. However, Nakada does not teach or suggest a rotor with permanent magnets, and, thus, does not teach or suggest anything about the curvature of slots relative to the magnetic axis of the permanent magnets. Therefore, (even if Nakada teaches that slots 2A are curved and that this curvature is, of itself, advantageous) Nakada also clearly does not teach or suggest that the curvature is such that a radial outer end of each accommodating space for conductor rods is turned toward the magnet axis.

As it would be possible to combine Nakada's slots 2A with Sasaki's rotor such that a radial outer end of each slot 2A was *not* turned toward the magnetic axis, and because nothing in Nakada or Sasaki suggests that slots 2A *should* be curved in such a manner, the mere combination of Sasaki's rotor with permanent magnets and Nakada's slots 2A still does not teach or suggest that the curvature

is such that a radial outer end of each accommodating space for conductor rods is turned toward the magnet axis.

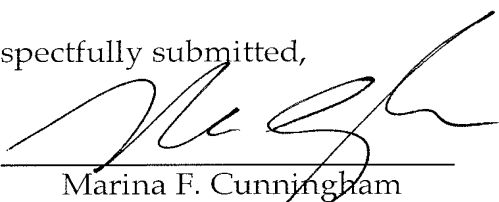
Thus, Applicant submits that neither Sasaki, nor Nakada, *nor the combination thereof*, teaches or suggests each and every recitation of Applicant's claim 5, nor is there any motivation to combine or modify their teachings to do so. Accordingly, Applicant respectfully submits that the rejection of claim 5 under 35 U.S.C. § 103(a) as unpatentable over Sasaki in view of Nakada is improper for at least these additional reasons, and should be withdrawn.

Having traversed each and every claim rejection, Applicant respectfully requests that the rejection of claims 1-19 be withdrawn, and claims 1-19 be passed to issue.

Applicant believes no fees are due in connection with this Response. If any fees are deemed necessary, authorization is hereby granted to charge any such fees to Deposit Account No. 13-0235.

Respectfully submitted,

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